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06 Broadband Strategies in United States and Canada

>> Jane Coffin: All right. Hello everyone, my name is Jane Coffin, moderator for this fabulous fanal, broadband strategies for the United States and Canada. Thank you to the organizers of the event for having us all here. Thank you to Joly we must acknowledge that because he's helping us live stream. Thank you Joly.

Round I've applause.

[APPLAUSE]

>> I'm going to do 22nd intros because we have the bios of these wonderful panelists on the Web site. Grace Abuhamad chief of staff at NTIA, long career. Marita Moll is president of tell community Canada, North America regional organization otherwise as as Narolo.

Ron Da Silva, sceltive leader international board member advisor in Internet technology expert, 30 plus years of proven business and also someone that's well-known at the ICANN space.

I'm not well-known at the ICANN space but I have been in the Internet space for over 25-something years, with as at the Internet society for ten years and worked for a start-up right now so I'm going to try and speak slower for those of us who have come in from other places and points beyond. Here's how the panel is going to run. We have up until about 4:45. We recognize there's a panel directly after this one. So we're going to give a little grace to the other panel, give ourselves probably around until 4:40. And Marita is going to speak first. She has some slides. Grace is second. Grace has handed out a doc to you and it's going to be useful to her presentation and Ron will speak after Marita. So Marit has some slides and I trust the slide master will get the slides up. Is that Eduardo?

>> While we wait for the slide coordinator. Hi, everybody. It's getting towards the end of the day --

>> Maybe put that mic closer to you.

>> Marita let's move it up.

Let's do this. Getting towards the end of the day. Everybody is probably suffering from a bit of information overload. I usually am by the time I've seen a few panels all day long. So I hope you can sit with us.

This is a panel about Canadian broadband in U.S. broadband strategy but I'm very conscience of the fact that this is not going to relate that well to many of you who are here. You have your own broadband issues at home that you're trying to build or have been built. So what I tried to do in my presentation is to put it in a much larger framework. I was involved back in the '90s in Danda when we were talking about broadband strategies and those things and everybody was really excited. We had research groups running research, you know, studies and workshops talking about --

>> (Away from microphone).

>> Sorry?

>> Someone needs to share the screen to Zoom.

Okay, grassias.

>> Marita: I hadn't started that yet any ways.

So we were developing various ways of rolling out Internet access at a time -- at that time when government was just as confused and beif you wouldeld by what was going on as the rest of us. How were we going to deliver this stuff to people. So we were actually getting

some air time. People were listening to us at that time, researchers and public policy advocates were really playing a role in how people thought about these things. Didn't actually work out that things were rolled out that way, but at that time it was pretty exciting. So what I wanted to do here is show you this particular slide. It's coming.

It's coming.

Any way, this one is not indicative of the weather outside. No. Nebltion slide. Yeah, it's a rainbow. Well, it is sunny. It is not sunny. It hasn't been range. We developed this in -- some of us in the research space to describe what needs to happen if you're going to have an Internet access strategy in a country and we put it together as seven different layers of things that need to be developed. Many of them at much -- very much the same time or all of them or quickly after another. You'll see that the very first one is carriage facilities, and that's all about, you know, getting the broadband to where you are and that's a bigie. Huge one. That's the one we're still mostly talking about 20 years later but the second one then is, you know, the fact that you actually have to have the devices, the laptop computers. Have to have the mobiles, you have to have all those things to use what you're going to get in the No. 1 carriage facilities. The software tools, the Web -- you know, the browsers and all that didn't even exist when we started this and you need to have -- that's the next layer that comes up on top of it. You need the ISPs, the people who are going to come to the market and make it possible for you to have these services. You need the content. Why would you have it? It's got to be some content. There's a bit of a chicken and egg thing here. What comes first, the access or content? Everything pretty much comes at the same time.

Then you've got something called literacy and social facilitation. People were talking about that in a previous panel and how important that was, that you couldn't just put it in there and walk away that you had to have a strategy for really delivering this and sustainable strategy because these things change and people need to be -- continue to be -- learn their way through this kind of a change and over the whole thing you have the big one, the big red -- oh, all right. We lost our rainbow but it's okay. It's the same thing. You have the big red governance. Want to go back one? Okay.

Just practicing. That's okay. Oh, okay.

And it was over top of all those other six layers. You have the governance layer. You had to have the government role in helping to make sure that all of these things get delivered to the people who need them and so that's a whole lot of stuff that needs to be done in order to get universal access to everybody. Here it is. Now, where are we now? So the

goal of all this, any ways, is universal access. It the nos just broadband strategy and I think we've fallen into the -- you know, the loop of just talking about broadband strategy for a long time now and not talking about all of the other layers that need to come together. Which means that often they're not totally funded or supported in ways they need to be. It's not that people don't want to do it but it falls off the radar.

Obviously, you know, the first band, those access facilities, got to happen. Taking a long time to get up there for the people who are a little more remote but we have to have the governance side of it and government up there making it an absolute priority. I love the public-private partnerships panel in that there was so many great examples of how some of this is being delivered there right on the ground. It never occurred to me that there was some countries where you were actually able to buy one minute access, you know, like real pay as you go or five minutes just to upload or download. There's all kinds of various models going on out there, not that, you know, we necessarily want that but it gives some people access who really couldn't get it at all otherwise. So that was great. So there were lots of good models out there. All of this fits somewhere in this access strategy, this seven layer strategy of universal access. So I want to go through these different things. What I thought was I'm going to give you the Canadian examples but I hope that you can look at wherever you're coming from, whatever context how is outlook in your country in your area? You know, if it's the government session, what kind of groups are out there? Advocating for that in your country? I'll give you a list of ours, but, you know, that was my intention here. So here --

>> I think you have to carry on without the slides for a sec.

>> I'll just keep on going. The canan yaid broadband, whenever you get the slides up here, you'll see it's one of these I've highlighted where on that seven layer strategy this falls, the Canadian Federal Government program falls in the carriage facilities, the No. 1 and shortest part of that rainbow. Yes, we have in Canada -- we say we have 98 percent of caneigheddans connected to high speed Internet from 2026. We think we now have about 90, 93 or 94 percent and the plan is to have a hundred percent connected by 2030. What does that mean, connected? It's not fierp optic connection obviously but it have a definition at least 50 mega bits per second download and a hundred upload. So 50/ten. It's not fabulous but if you're living way up in the woods in northern Ontario, you know, it's way better than what you've got. And another part of it was to have access along major road corridors so people would be able to communicate when they were traveling, which is a big deal for us, big country.

Okay, we're still not there?

>> Sorry.

>> It's okay.

>> (Away from microphone).

>> It's okay.

I think everybody's following. They don't need to see the pictures.

There are some specific federal initiatives. One of them is a 585 million-dollar initiative to deal with the last mile for 975 rural communities, including digital -- Indigenous communities. One thing I wanted to say here is that I was going to bring this in in the public-private partnerships panel but I decided to leave it for here. In Canada any ways, the Indigenous, some of the Indigenous communities really took the ball at the very beginning and said, no, we're not going to do public-private partnerships. We want to own the -- we want to own what goes on here. We're the ones who are going to run the project. We don't want the money to go out of our community. We want it to stay in. We will contract the tell Co is and do the other work that needs to be done. We're going to organize, manage and control it. And some of them have done a really, really good job of that through hundreds of kilometers of northern Ontario. You've got a inclusive education manhattan network called KNET that started way back in 1994 when they made that decision they were going to own it. We tried to do a lot in Canada about community owned networks but as was indicated in the panel before, it's a hard road. You know, you have to have everybody motivated and on the same page. So a lot of these things are being done by public-private partnerships. And it just -- that's just the way it is and many times it happens or it doesn't. There's a big universal broadband fund, 3.2 billion all together for rural and underserved communities and then there's a special fund for the first nations which I just described in our country any ways is in many places is operating quite differently. They're the ones who are owning their own infrastructure. There are also some other communities who do but it's hard and they're much fewer.

Broadband timelines as I said by 2030 the government is hoping to have a hundred percent of Canadians up there access what they call -- what they define as high speed Internet. And and everyone hopes they'll get there but these are aspirations. We've come a long way in the years in between the mid-'90s and now. There's a lot done but quite a bit to be done. A lot of projects going on in Canada on the Federal Government side. Got a Canadian satellite company who's provided connectivity to the far north. You've good the Canadian government giving software tools to small businesses to upgrade their digital technology. So that kind of falls into a different part of that seven layer structure. If you're

talking about software tools that's like No. 4 or something. It's not just the carriage line which is mostly what we're talking about. And then there's also the issue that the Federal Government really does carry the big load of the ball when it comes to governance obviously and they are doing a lot of work around legislation Re content and affordability issues.

Oh, look at that. That's the wrong one but any ways, let's go with it. Just run with it. Keep going. Push it down. It's the same slides. It doesn't matter if that one's crooked.

Yes, we talked about that. We also have in Canada a regular later which is called the Canadian radio and television communications commission. Certainly in the U.S. there's a heavy duty regular later. In Europe they have them. Don't know if they happen in all the other countries that are represented here. The regular later is also heavily involved in that governance stream that over arches all the other parts of the universal access rainbow.

In Canada, one little interesting quirk is that the regular later actually has a 750 million-dollar fund which they're devoting to access carriage issues, but that money is actually coming from the telecommunications companies and it's part of their public interest commitment to providing access. It's not as much as the Federal Government is providing in their plan but it's kind of an interesting little tweak that the regular laters doing this speaks to what we used to do in Canada many years ago around the telephone in that we subsidized access in rural areas with some of the -- you know, the funds that were coming into the telephone companies from the urban areas. This is sort of a vestige from that. People were talking about that at the time in the '90s, why are we not subsidizing with the government, through the government some of the rural and remote accession issues. We're finally doing it, but it's taken a long time.

>> And we have about a minute left?

>> Sorry?

Okay, yeah, I'm almost there.

So we had an auditor general's report recently in March which told the Federal Government that really they had to hurry up and do that that the numbers weren't as high as they said they were. But the other thing that was really interesting about it was at the level of families, the auditor general in Canada said the governor needs to assess affordable in the context of household incomes when rolling out the access programs. So doesn't matter if they all have this when they can't afford to do it, when they can't afford to

buy it. They can't pay for it. That was an important addition to the program we got from that report.

The next layer, digital I will literacy accessibility, we have a number of organizations in Canada that do digital literacy work but as we heard in the privacy much more work like that has to be done all over the place. Can't be one shot deals and people don't have anywhere to turn when they actually have a problem.

We have a lot of provincial programs. Provincial government also gets involved. And -- I'm almost at the end. I'm at other sources of funding.

Other sources of funding come from the actual provinces who put money in and then they share some of the load. The municipal local and community initiatives are also important. We're going to be having a panel at eye can which is going to include some community members to talk about what they're going to be doing but we heard some really great stuff at the public-private partnerships one. People are doing work at the community level which is things that are really touching people on the ground.

Yes, we have already been there. This and then the one thing I wanted to say is at that time we had a lot of advocacy networks and research networks who were looking into this and speaking to policymakers about what needs to be done. We have another list here on the slides that I did. It's a shorter list. These people are still working. Maybe in your countries, think about it, how many people are out there holding the government to account for what's actually happening? Because that's what needs to happen. People need to get out there and make sure voices are heard. The Telcos are heard. If there's nothing coming from the research network showing how and why this stuff needs to happen and get to people on the ground and be sustainable and accessible, then we haven't got a national access strategy. So I think I'll stop there.

>> Thank you very much. That was 15 minutes.

[APPLAUSE]

Excellent. Grace. You're up. Ten to 15. You pick.

Can everyone hear me?

>> Hi everyone I'm Grace. I'm at the national telecommunications and information administration which is the big federal entity in the United States that is sort of administering the broadband the Internet access work in this administration. I don't have any slides for you but did I pass around with the help of Jonathan passed around a set of

one pagers. I won't be going through all of them in detail but I thought they would be helpful for you because there are a lot of different programs that we're administering. They have different purposes. Different amounts of money associated with them, et cetera. So sometimes having a leave behind, it's also online on the resources page but it just helps -- it helps me on a daily basis keep track of all the programs.

Most of you know we have been talking about the digital divide over 20 years now and in fact the term itself was coined by former administrator of the agency that I work for. This is is a moment for the U.S. Government. We have been given simple but ambitious mission which is to connect everyone in the United States and that is a huge project because it has been attempted a few times before but this time the difference is there is a very, very big investment being associated to it. So I'll walk through this for you but this administration and Congress passed the what we call the bipartisan infrastructure law in November of 2021 and that includes roughly $65 billion for infrastructure investment in different connectivity funds in the United States. And that includes the 50 states and territories of the United States. So it is a big program when you think of where Guam is located and other territories of the United States, right? There are some key pieces of this. I'll walk you there you each of the program. But the simple mission here is also -- so connect everyone in the United States and connect them with reliable and affordable Internet service. So there's no point -- I think Marita said this earlier, there's no point in connecting people if they can't use the service, if they can't afford the service, and if the service in some way is unreliable then near not really using the service, right? So we've defined -- I challenge you a little bit as part of preparing for this panel, I did a lot of comparing of Canada and the U.S. I challenge you a little bit to think about that in your respective countries when we're -- as we're discussing the topic. We define what reliable services different than the way Canada has defined it. We put a different set of restrictions or even sort of -- not restrictions but sort of requirements on the program different than what Canada has provided. We have different sources of funding. Different programs. So we can compare and contrast all of those shortly in the discussion but as we're going through the presentations I challenge you to think about that a little bit.

The theme for this Internet governance school is access and inclusion. If you think about the Internet today, it's not -- you understand why this mission was key for this administration. The Internet is an essential tool now. It's not a luxury, it's not something that's fun, hobby for people. It might have started off that way for some but today it's an essential tool to provide access to work, healthcare, justice, we've talked a little bit about different examples of that throughout the day, but, you know, this is a very big initiative.

And in part in some ways despite how difficult the COVID-19 pandemic was, I think so it demonstrated to people the need for this essential service and essential tool.

So you can look at the handout I gave but basically there are five key programs that we're. Administering. Not all of them were punnedded purely out of the bipartisan infrastructure fund. Some of them had existed before and were either reuped or, yeah, sort of reupped or coordinated with -- by my agency as part of this effort. So we called this as the shorthand we call it the Internet for all program and there are five different pieces of it. So the first one and largest one is BEAD program. That is a big state grant program that, again, this is a -- for comparison point of view, Canada has a number of proive convinces, have a number of states and territories. The way that the BEAD program is designed is that it is a 42 -- roughly 42 billion-dollar program with money going directly to the states and territories. So -- we as the federal agencies grant them the funds and from there they develop programs that are best suited to their specific state. You can magus like in Canada and other parts of the world, each state has a different geography, a different local community, et cetera, and so we want to give the states some flexibility in how they design those programs. There are, however, requirements for how they design the programs and that is part of the sort of the federal state interaction. One of the key pieces in a lot of these programs but especially in BEAD is they're required to do local coordination. So when we're talking about multistakeholder engagement and Internet governance and sort of the work we're doing here, it's an interesting piece that sort of the states are doing the same and they're required to do that and demonstrate they've engaged with their communities as they're building out these programs.

The second key program is the digital equity act, digital equity program. There's two pieces of them but ruffle they're $3 billion. They're for either state level grants or sort of a competitive grant program. This is to provide, again, Marita talked about this, the devices, the skills, the training that for people once they come online or even for people who are already online but need additional skills, these are programs designed for that capacity building exercise. The third program is roughly another 3 billion-dollar program for tribal or indigenous community grants to households or local anchor institutions. So, again, focusing there on a particular community. The Indigenous communities are covered in the other two programs but this was a specific we're going to give a specific pot of money dedicated to Indigenous connectivity in the United States. We say tribal but Indigenous first nation, essentially the same thing.

The fourth program on your sheet is what we call the middle mile grant program. That's a billion dollars dedicated to middle mile infrastructure. So maybe not as -- you know, maybe not as cool and engageing as some of the other programs because the -- your end

user is lessen gauged on a middle mile program but very important in terms of keeping costs low. So when you think about and maybe Ron will talk a little bit about this in his presentation but when you're developing infrastructure, you've got the big capacity that happens sort of at one level. Then you've got -- you know, your middle mile connection and then you've got your last mile connection where you want to make sure there's -- that's where the users are paying for service, engageing and you want to make sure there's enough competition across the board but especially at the last mile level.

So the middle mile piece really the goal of that program is to reduce the cost of the last mile connections for users. And then the last foreman which was not through the bipartisan infrastructure law but we have sort of grouped it together in our work is a pilot program called the connecting minority communities program. And that is the smallest $260 million for us to connect and do skill building with historically Black communities and Universites, minority serving institutions, some tribal institutions, and a variety of other sort of covered populations or minority populations in the United States that would benefit from a concrete effort on skill building. So that program is designed to go to institutions that would then initiate or manage programs for building skills across the United States. So we have a -- those are the variety of programs. We can talk more about what each of them mean, how they're going, what we can learn from other countries as we develop them. I think Canada's program for 2030 is ambitious. Ours is ambitious as well. We look forward to sort of inspiring other countries to do the same or learning from their experiences.

Turn it over to Ron.

>> Excellent.

And we have Ron. And Ron you have a couple slides, yes?

>> Ron: We'll find out.

>> Why don't we just have you start and you've got ten to 15 and you're off and running.

>> Thank you.

So I wanted to take the presentations you got from Rita and from Grace. We're talking about policies and funding and really the government's taking initiative to create incentives and really address accessibility issues in rural parts of North America. That's fundamentally what is motivating a lot of those programs. And I was going to take a different lens and look at it from a business and technical perspective. How does that actually impact the marketplace and what is going on throughout Canada and throughout

the U.S. based on those funds that are being pushed through in these variety of programs? I think there's a big one just to add, Grace, because I had a question, on the material you presented, around the treasury department. They have a separate component, which is another $20 billion or something like that, right?

>> That's right.

>> What was that number?

>> Grace: I only presented on the programs that my agency runs. But there a's huge number of programs across the Federal Government including the treasury programs. I think 20 billion might be --

>> Ron: Yeah, so another very large component in the U.S. ecosystem that's impacting businesses and operators in their efforts to get the last mile completed in many rural and what I would call ultra rural parts of the country. And similarly I think you're seeing that in Canada. So that said, I have four slides. And the first two are really going to talk about some of the technology and then I want to talk about some use cases, some examples. So first slide might advance.

[PAUSE]

>> Ron: As we wait for that to show up -- it doesn't show there. It doesn't show here either.

So very high level, what are the technologies that broadband addresses? If you look back into the legacy of telecommunications, a lot of it was all twisted pair, small little pieces of copper stranded across telephone lines to create telephone services and those same copper wires were used in the '90s to develop DSL. And DSL was a great bridge technology, enabled telecom operators to leverage their installed infrastructure to provide more through put than you could get with a dial-up service. That's really what DSL provided. Is that useful today? A lot of people would argue no and a lot of these programs aren't really focused on helping create more DSL. It's sort of a long-term technology that's lingering and a lot of communities are now frustrated trying to, I don't know, use Zoom to talk to their family members or to work from home and that's not really a technology that's going to help.

Another is mobile, right? Mobile is really convenient in urban areas where there are plenty of people to justice building tours and there are lots of tours then in place that provide a density and give you reasonable connectivity to make phone calls, maybe do Zoom while you're driving, you know, be able to order apple son while you're supposed to be sitting in

a meeting, right? These are the things that maybe your mobile phone will provide you, but when you move into urban -- rural areas or really ultra rural areas, the cell tour density is not there. The radio coverage doesn't exist. The throughput, which is required from the tours to get back to the rest of the world where maybe the data centers are located and where the content is that you're interested in, that doesn't exist either. So even if you might have a good strong carrier, how many of you have looked at your phone and said I've got five bars, why isn't my Zoom working? Well, you've got radio connectivity but there's no back call, it doesn't go anywhere. So mobile is interesting but is it broadband? Is it really impacting the rural markets? No, not really.

And another here is Doxis. Cable companies have invested in years in cable TV infrastructure all with coaxle cables and a mix of that and fiber kind of extend their infrastructure out to the end users, but, again, in most cases that's in suburban and urban areas. It's not really that preb lent in rural markets, especially ultra rural markets. So even though there are capabilities with the Doxis specifications to push higher bit rates through on coaxle and fiber systems, it really is not that impactful for rural markets.

Next slide.

So these are things that aren't working.

Some other things that are being attempted. Wireless. And what I mean by wireless and licensed and unlicensed spectrum done in sort of a directional wireless transmission and then when it's in the small cluster of homes, use unlicensed spectrum like you would a big Wifi hotspot. Think of it that way. That provides some value. It provides some connectivity, but again it's really hard to scale that when you have no density. If everybody lives miles and miles or kilometers from each other, simple radio to do public Wifi is not going to help anybody other than the one barn on somebody's farm, right? So interesting has its place, not really addressing the rural market. And then Leo, right? There's all this cool stuff that you're probably hearing about. These new companies doing this low orbit satellite infrastructure and, yes, that might fill some of the gaps, not only in rural markets but think of national parks, think of floating around in the middle of the ocean. I mean large chunks of this planet are nowhere near anything of interest from an infrastructure standpoint. Maybe that's going to provide some coverage. Technologically, sure. Economically, there are a lot of questions about the cost to throw all those satellites in the sky, the cost to aggregate all that traffic and do something with it and will the economics really make sense? I mean you see that in the funding that's going to some of these startups around low orbit Internet services. It's a question mark. I don't know the answer. Maybe it's going to be something useful. Maybe not. And then lastly fiber. Fiber, okay, I'll

share my bias, yes, I like fiber. It's a great technology. It's got a lot of transmission capability across it, but it's very expensive. We talked about economics of getting to these, you know, long distance locations where fiber doesn't exist. So talking about that middle mile. It is not there, right? And without a middle mile, you can't have a last mile. And that's one of the reasons why NTIA is focused on that. A lot of the -- I think some of the applicants for the funds in Canada are also including middle mile infrastructure to get out to rural parts of of the country side. Think of a small hamlet, two, three, four people that maybe live in a small area and between them and the next hamlet, miles, miles. Kilometers, kilometers. There's a lot of distance. There's no extension cord, you're not putting anything there that's going to be useful. So that's really from a tech standpoint, fiber would be great if it were cheap. Fiber would be great if you could magically make it happen but you can't. That's really driving some of the incentives from the government to help coordinate with the states, coordinate with private money, operators. Find some way to really incentivize getting that last mile done for rural America, rural Canada and the farthest remote parts of rural North America. Next slide. That's the tech. I want to provide an example. I live here, D.C. suburbs. Laudin county pictured in the map here. You can see D.C. is way over here where it says Washington and this big funny looking shape that's got a red outline to the left, that's the county where I live. And if you are from out of town and flew into the Dallas airport that's in like the -- sort of the right edge of that big red county outline. So you just landed in the edge of Laudin county if you flew into Dallas airport. Well I live right there. I'm on the communications committee for the county. I've got ten visibility not only what's happening with the broadband operators in the county but also how are these programs we're talking about impacting rural communities? Why? Well, if you divide Laudin county in half you can see a highway right in the middle that yellow line fromlies down called route 15. There are some 400 plus thousand people that live in the county. 80 percent of them live to the right of that yellow line. The other 20 percent, it's mostly a rural farm community. A lot of horse farms. A lot of cows, a lot of crops, and a lot of trees, a lot of great -- I mean, you can see this bottom left picture, this is what you look -- when you look west in the western half of the county out towards the blue ridge mountains, this is what you see. It's beautiful. What does that mean? Well the people who live out there. They don't want some big ugly cell tour there. So there aren't any. Cell coverage is abysmal. There's, you know rs the density out there is very low. Like I said 80 percent of the county lives east, 20 percent is spread all over the other half and the economics just don't make sense. I'm a service provider and spending $20,000 to put a hundred meg bidirectional fiber connection to your farm and I can charge you a hundred bucks a month, quick math, how long does it take for me to turn a profit? That's just the capital cost to build the thing but I have an operating cost annually to maintain and grow

because capacity is going to continue to drive demand. So it's not just the cash up front, on-going cost. So the economics don't make sense, right? That's what we had in western Laudin. Through these programs there were roughly 8600 homes we identified. 8600 farms basically in the western part of the county that had zero Internet access. Their mobile coverage was abysmal. They had -- no such thing as DSL. Some of them tried the line of sight radio infrastructure. It worked for maybe one or two of them but think what happens when you have a bunch of hills. It's hard to get a radio line of sight to somebody's house if there's a bunch of trees and dirt and rock in your way. Not a really good option. 8600 homes were identified and we came together, talking earlier about private public partnership arrangements and also about NTIA and treasury funding options also the state of Virginia also has own incentives to try to encourage to close that digital device throughout the state. These organizations came together.   Segra who was looking to implement a basic fiber infrastructure sale to the county commission got, it's useful for the schools. It's useful for the public utilities and public infrastructure parts of the county that they're responsible for but if we can leverage that as last mile, find a way to encourage the operator to put extra infrastructure in place beyond what they need just to meet the county's needs, then they could use that as a way to incentivize other broadband operators to jump into the western part of the county and so we were successful getting it added to the contract and having a way to ensure anybody can come and use that as a middle mile way to get out to the western part of the county. That existed. And then all points broadband is an operator. I think they're middle of the state based and they're hitting lots of markets in a rural way throughout Virginia and also North Carolina and some of the surrounding states and they came along with many others bid on an opportunity to get some county funding, state funding, federal funding and mix all that together and really address these 8600 homes that are left. So from the Virginia fund, they were able to -- so 60 million -- think about it. 8600 homes. 60 million bucks to build it. Quick math. How much is that? 7,000 bucks, something like that? Order of magnitude. Let's say they're not an ACP. And remember that term from earlier, affordable care program a way to get Internet access for 40 bucks a month let's pretend you're not one of those and maybe a hundred dollars a month, meg service or one gig service or whatever, right? How many months does it take to get your capital back if you spend $7,000 to build out to one of these things? That's like five plus years, right? That's not a good business plan. Doesn't make sense. But if you take some of that cost off the table through the Virginia telecommunications commission, that's the body, they were awarded 18 million buxz. By the way, I'm sharing all this because by sitting on the commission this is all public information so I was able to just use this as a great example without having to go through NDA issues I've got from other programs from my consulting practice. So that's where this

was coming from. Just under 18 million bucks and then through the ARPA plan that's administered through the treasury department, they got another 12 million bucks and then the company itself went to private equity mentioned -- gave them some cash from a private equity standpoint. Then they did some partnerships with some of the utilities in the area. Dominion energy is the primary electrical supply utility for the state of Virginia. And they have right of ways that go through a lot of this infrastructure. A lot of the country side where they have their, you know, high power delivery infrastructure and that gives them an easy way to put, you know, new lines down and reach throughout the county. Same with Novac, utility co-op in part of the northern Virginia area. By leveraging partnerships with both of them as well as having access to Segra for some of the middle mile for federal funds and put it all together now it works. You know, the numbers work, the build works theory a couple years out from having service delivered to these 8600 homes. Great example applied there.

Jane, we're at time?

One last slide.

So that's Laudin. Let me talk about a couple different issues. When you go rural and you go north, like in Canada so same kind of stuff applies that I just talked about in rural parts but big chunks of Canada are frozen for a big chunk of the year. You can't do construction. You can't build. Even if you have the money you cannot go out and do the work. They got to wait until it thaws and it's soft enough you can go dig in the ground and put infrastructure in. It's a little different. Distances are considerably longer. You know, so you have to leverage other technologies as a way to try to make that work and still not break the economics. Right, if I'm talking about 8600 homes packed into half the of the county and you put I don't know, 800 homes packed into northern Ontario like the economics are very very different.

So, yeah, other limitations there and I question everybody's going to get it if you're counting mobile, because my non-- my generality of what mobile is like in rural parts of Canada is it sucks.

Yeah, so they're not counting mobile when they're doing their charts Marita said. But I'm going to make sure if somebody's out in rural parts of Manitoba or whatever and they have mobile they're probably not happy and they're used to not having that Internet. There's that whole education thing we talked about earlier, until they know what they're missing and how this might enhance and make their lives better they may not be complaining. Mobile's not good, they don't know why they need Internet. So there's an education

component to it. So that is a couple ways these programs are impacting North America and how I think collectively that's helping address some of the digital divide and get some inclusive in place.

Jane.

>> Excellent.

>> So for some of our guests here in the room from other countries, basically Canada and the United States are getting subsidies from their governments, yeah, for the infrastructure and because it's so expensive to build out. So it's more of a kick starter isn't it in some ways because the estimates are upwards of 100 billion I think for United States if you're going to try and cover a lot of the U.S.

Question for you on digital equity and inclusion because this is a big buzzword in the United States right now and every person that's working with funding programs is talking about digital equity and inclusion. Do you train people first and then give them broadband or do you give them broadband and train them after? What do you think? So one minute answers if we can so we can do some speed rounds here. Marita? You're up.

>> Marita. You can't train people if you don't have any Internet there to train them on so you have to do many of these things at the same time.

>> There's some offline broadband tools that people are using in developing countries. I spent 25 years working around the planet so you can use a Mac book -- or a different device to do some off line training but that's a great point.

To Grace what do you think.

>> We're doing both and we're working with communities to do -- to get them excited about what the possibilities are. And when you imagine the possibility it is sort of takes you in different directions.

>> Ron: Yeah, I'd say both too but I'm going to point back to Grace something you said earlier which is hey, COVID helped. That was like a big education for a lot of people. You know, living in Laudin county and hearing the challenges in the western part of the county if kids are now supposed to do school but what is Zoom, how does that work, they don't have Internet. So they're like literally sitting in the parking lot of McDonald's or the library because the librarieses are closed by the way so you can't go in the library but you can sit in the parking and hope to get a spot of Wifi. That education part of why you might need it I think was accelerated by COVID.

>> So digital marginalization, or the digital divide as Grace had said Larry Irving a former administrator at the NTIA who was my boss when I worked there helped coin the term in the United States for those of you that might know what the international telecommunication union is, the ITU, if you look back 50 years almost, 40, there's something called the Maitlin commission report, it's called the missing link report. That report was about the Telco fact, some of the copper deployed throughout the world, no lines. So now we have these gaps that are out there. There's been marginalization. Is this what the U.S. program is going to try to solve now is that marginalization because some of these communities are a little cranky particularly in the southeast part of the United States. I work with some folks in what are called the Black Indigenous people of color, the BIPOC communities. So if he they don't have Internet and thief got some really bad copper and the COVID did say gosh this is the best advertising for building networks ever, it was for me and the communities I was working with, how do you work with other government agencies, Grace? Because this is one of the big deals. Government agencies weren't talking to each other before the pandemic. Some were. They were trying, right? So now what other agencies are you working with across the U.S. Government? I'm going to go to Marita after that and then Ron, explanation about a little bit of what you're doing at the local level to get up to the state level. So Grace, who else else does NTIA coordinate with.

>> Grace: You heard when Ron was presenting he asked about the treasury program and I gave the wrong number. It's actually 10 billion for treasury, not 20. Big, big difference. But the -- to Jane's point, when we mean connect everyone, we really mean connect everyone. We take that very seriously. Congress takes that very seriously and they put -- they designed the programs in a way that there's sort of -- it's an all of the above approach, right? So there are grants demonstrated -- administered by the Federal Government. There are grants administered by states with some oversight, grants that are directed at rural communities, grants directed at people -- BIPOC communities, minorities, indigenous communities, et cetera. There is all kinds of approaches here. That's why I tried to outline some of them for you because they all have a different flay I ever and mission and set of requirements associated to them. In terms of coordinating, so that was the sort of instruction from Congress. In terms of coordinating in the government I talked a lot about the department of customer programs, NTIA programs, the majority of this broadband infrastructure funding but like in Canada we have an independent regular later, Federal Communications Commission. They have had funds thatthy administered historically. Some of them like Marita mentioned funded with this sort of fub service commitment or sort of a tax on private companies and others that were granted during this investment. We work with the Federal Communications Commission. We work with the department of treasury. So they have the capital projects fund, this 10 billion-dollar fund. That was

designed primarily as a -- in the context of the COVID pandemic, you know, trying to create investments in all kinds of different pieces, economic recovery, right. So broadband is a fees of that but not the only piece. We work with the Department of Agriculture. They have a billion dollar program that is specific to expanding access in rural communities because the main community the Department of Agriculture is the farming community and primarily based in rural areas. Giving them access has a sort of specific mission and connotation there. Those are the overview programs but I can tell you from the inside there are lots of coordination meetings inside the -- in the Federal Government with lots of different agencies because even though those are the agencies, the ones that I just named are the ones that are the primary agencies administering these programs, you know, we work with all of them because, you know there,'s an education component. There's a healthcare component. There's an energy and utility component to this. There's a lot of coordination, the Department of Transportation is doing a lot of investment and infrastructure. Can we work with them so that where he don't -- when we're building and doing all these big projects that they can be sort of coordinated, you're digging once, that kind of thing. So there's a lot of work across the government, a lot of coordination and a lot of engagement at the federal -- at the state level too. I mentioned this to some of you earlier but at NTIA this is the first time we've had -- since the bipartisan infrastructure laws passed really the first time we've had a remote workforce. Talked a little bit about working remote earlier today and some folks talked about how the government is increasing that access. We are dock it by -- because we have to. By necessity. We wanted to make sure we had 1NTIA employee in every state and territory across the United States because we wanted to make sure their job was to coordinate and share local coordination, work with state broadband offices in order for that engagement to happen we had to put people there and make them remote. Up until then, we had a staff that was primarily based in Washington, D.C. and some based in our research lab in boulder Colorado but we didn't have a staff that was based across the United States as the operations person for the agency, that changes the dynamic a lot. Every time there's a hurricane or emergency I got to find where people are and it's -- I can't just focus on two locations. I'm focusing on 56. So there's a lot of coordination in the government, within the agency, across the government, federal, state, et cetera and internationally we work a lot with the ITU. Work with a lot of governments. It's a lot of work.

>> Excellent. Marita you had mentioned indigenous communities or the First Nations in Canada. How is the Canadian government coordinating with the First Nation communities.

>> Marita: Is that is that on? There is a particular fund focused on the first nation communities and the government has been very active in trying to connect them. As I

mentioned, they have been pretty proactive in telling the government exactly what it is that they required and how they wanted to see it rolled out. Quite a number of communities have got their own broadband networks. British Columbia's particularly been good at this and, you know, that they've had a First Nations technology counsel since I can remember in the mid-'90s and it has always been active and B.C. has been busy. But they're still not finished. None of this stuff is finished. So remote some these places it's hard to get to them. And as we're saying coordination of all this stuff is really difficult. Some of this stuff has been going on for so many years. And it's still not done. And the money doesn't always get spent, is the way it's supposed to get spent. You know, we have these 4 billion-dollar program about small business adoption program. 3 percent of it's budget was spent in the first year. So they're just not being able to roll it out. The business says when it's too complicated and there's too much red tape you have you have to fix it before we can use it. Still a lot of grit in the system. I don't know whether we're going to get to a hundred percent by that time but I'm glad people are actually talking about it, working on it and I think it's the pandemic that did it. We suddenly everybody woke up said hey we got to do this.

>> I'm going to come back to the point you made about accountability in a sec but Ron you have a unique perspective because you're on a -- can you explain from -- what that means and how you coordinate at the commission level in your city up to the state.

>> Ron: Yeah, and then I would love to make a comment about the Indigenous Canadian market challenges.

The county of Lauden has from a government standpoint there are eight elected representatives. The county is kind of broken up -- remember I said there are 400,000 plus people there. Broken up eight times 40 to 50,000 people. So it's divided by population and like I said like only two of them are on the western half. And then there's an at large supervisor that's elected. So each district represents their -- sorry, elects their representative. Those are the nine representatives and the commission is really there to serve the supervisors, the elected officials and advise them on primarily it generated from cable TV days on franchise agreements for cable TV distribution through throughout the county but it's evolved to be no just video distribution but also broadband related activities. That's really the role and so our interactions as a commission with our supervisors as well as with county staff on activities that go on from a legislative standpoint in the state of Virginia or legislative things that are coming out of the Federal Government we interact with the legislative liaison and advise them and give them direction. We work with the grants and the IT program facilitators in the county who are the primary ones working with

the state and then through the State's help or directly with the federal programs so we kind of work through at that system. That's kind of a local view up and to how that comes from a public version, but back to the Indigenous Canadian comment for a minute, one thing I've seen in Canada that's been exciting is in some of the Indigenous communities you have a tribal council that can make a decision for the entire community to say we're putting broadband everywhere and wholesale we're going to build the whole community and be done with it. You still have to connect it, back hall it to somewhere but it makes the construction so much easier. And primarily consumer environment where you need permission to go on to their property and dig it up and put a hole in their wall and stuff like that without permission kind of limited to what you can do. But if the tribal says we're doing everybody, you can do it all. That's kind of an interesting per spigottive on what's going on in Canada.

>> There's more data on the Indigenous community summit Web site both at the Internet society and connect humanity, the Indigenous connectivity summit, the 71st was just held in Alaska. I was part of the creation of that with Mark Buhl who many of you know who's from Canada and worked for the Canadian Internet registry authority, Sera and he's also connect community. That's a way as Ron is saying where a lot of the tribes do come together and the First Nations. Some sacred land you can't build on. You've got to figure out how to deal with that at the tribal level. There's lots of different governance issues there. We're at about a speed round of a minute left for each of you because I want to make sure we get the other panel up here for their start. But accountability is something that's really important and Marita you had talked about the fact that maybe some of the money hadn't been spent in Canada and Grace you're up at around 60 billion that needs to be accounted for. This is a huge issue and in many of the communities at the local level are going to hold people accountable for, A, either getting connectivity or not, B, where that money goes and how are we keeping track of it? This is a massive issue and some people I know are actually putting local covenants together at the local level to hold network providers responsible for connecting the under served first. That is something is a tacketic that people are using at the local level, at the local last mile level where if there's a buildout, you've got to get to those folks that are unconnected first or underserved. So Ron, what would you say about accountability? Minute and a half.

>> Ron: Yeah, I've seen it's being implemented differently in each state. It's really I think more of a state level that's then partnering with the locality. And I'm encouraged to hear NTIA is really ramping up to help with that process because I think that's overall going to address the accountability component. I know here in Virginia, you know, the department of housing and -- oh shoot I forgot the rest of the acronym stands for. You know, they're

leading that for the state and they're putting a dashboard together and they're presenting to the citizens of Virginia here's where that money is going and here's -- so the accountability piece is which -- you know, who got awarded what money to where and how far are they along with their process and stuff. So it's there but that is very different in other states. So I think that's a challenge and I'm glad to hear NTI is -- that's on their radar.

>> And you have open meetings, yes, at your --

>> Ron: Yes.

>> Moderator: County level, right?

So those of you that may work with policymakers or civil society and want to get in and talk to your governments there are ways to obviously force that and Rita I turn to you at the end hereafter Grace to helpous civil society and working with government and accountability. So Grace, you're in an agency and you have a lot of funding going out the door. How are you holding the people that you're giving that money to accountable? So there's two pieces to this. The -- there's engagement and there's some technology. I'll start -- but I've already talked about how the programs were designed by Congress. They have -- they're pretty -- they have a lot of requirements in them. If you pull the statute and then the notice of funding opportunities that we sent out, there's a -- they're pretty involved. So there's a lot that we're sort of presetting here and requiring at the outset when States submit their plans. So that's one piece to sort of set the expectations. But the two pieces that I want to get to in the one minute here is engagement and technology, right? So in this case, again, unprecedented for NTIA level of engagement. We're out in every state, working with them, explaining the requirements. We're providing assistance where some of those requirements may be difficult for folks on workforce, on, you know, how they're going to serve buildout, estimates, et cetera. So we're engaged deeply with communities and I think they hold themselves more accountable when they know that they're engaged. And that their local communities are engaged and watching too. So there's a lot of coordination both from the federal side and local communities on that piece. And then the technology piece really interesting again, I come from a -- at this from mostly the operational side of NTIA but we have technology now and software that allows us to really track status of funds in a, you know, daily, minute by minute. We're really keeping up to speed. So we're building a lot of that capacity at NTIA and it's new. This is government technology procurement. I will spare you the details but it's a process. But we're doing that. Building out some pretty state of the art or, you know, for government state of the art tech and it's going to help track and monitor the funds that are administered at the state level.

>> Moderator: Excellent. Marita in a minute and a half, accountability, citizen level interface with government, pick one of those.

>> I think everyone's going to anticipate my answer. The resources for that kind of thing are really, really slim. They used to be better and as I said government was actually looking for some civil answers and some guidance. That is no longer the case. There's always opposition and the voice is and the voice is very hard to get the voice in because obviously the lobbying the lobbying that goes on in the background, that's where the government ears really are. We do what we can. We don't have access to the kind of trust funds that you have in the states. So, you know, that's just not -- and, you know, public advocacy groups don't really like to go to, you know, vested interests for a lot of money because it doesn't look very good if you're being sponsored by Google or Facebook. So you can't go there either. So it's a very hard thing. I have to say I was so grateful when Zoom came around and was -- everybody could access it and the free part of it, we could actually meet as a group on Zoom. Wen't had been able to do that for years.

>> Moderator: Wonderful. Give this panel a round of applause.

Thank you very much.

[APPLAUSE]

And we thank you all for listening and we're going to turn it over to the next panel, but thank you for the great perspectives.